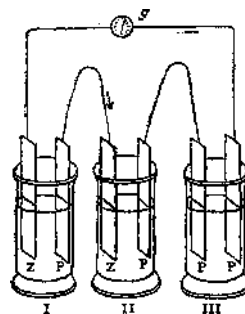


the whole of any plate; and occasionally small glass rods were put into the cups, between the plates, to prevent their contact. Single plates were used to terminate the series and complete the connection with a galvanometer, or with a decomposing apparatus (634, 703, etc.), or both. Now if fig. 50 be examined and compared with fig. 51, the latter may be admitted as representing the former in its simplest condition; for the cups, i, 11, and in of the former, with their contents, are represented by the cells i, n, and in of the latter, and the metal Fig. 49. plates Z and P of the former by the similar plates represented Z and P in the latter. The only difference, in fact, between the apparatus, fig. 50, and the trough represented fig. 51, is that twice the quantity of surface of contact between the metal and acid is allowed in the first to what would occur

in the second.



745. When the extreme plates of the arrangement just described, fig. 50, are connected metallically through the galvanometer g, then

the whole represents a battery consisting of two pairs of zinc and platina plates urging a current forward, which has, however, to decompose water unassisted by any direct chemical affinity before it can be transmitted across the cell in, and therefore before it can circulate. This decomposition of water, which is opposed to the passage of the current, may, as a

matter of convenience, be considered as taking place either

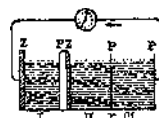


Fig. 51.

against the surfaces of the two platina plates which constitute the electrodes in the cell in, or against the two surfaces of that platina

plate which separates the cells 11 and iir, fig. 51, from each other.

It is evident that if that plate were away, the battery would consist of two pairs of plates and two cells, arranged in the most favourable position for the production of a current. The platina plate therefore, which being introduced as at x , has oxygen evolved at one surface and hydrogen at the other (that is, if the decomposing current passes), may be considered as the cause of any obstruction arising from the decomposition of water by